which occurs in most of the geographical province. New Churchman's Road lies in an area where silty Coastal Plain sediments lie atop gravelly material which originated on the terraces of the Piedmont Plateau (Matthews and Lavoie 1970). For this reason, Holocene landscapes are not deeply buried and archaeological sites are relatively shallow.

A few miles to the west of the project area, outcrops of high quality cryptocrystalline silicate rocks can be found. Brown jasper and chert are found on the southwestern slopes of Iron Hill near Newark, Delaware, and on the slopes of Red and Gray Hills of Cecil County, Maryland (Custer and Galasso 1981). Quartz and quartzite resources are also locally available in cobble form in gravel and stream beds throughout this portion of New Castle County. These resources represent important sources of raw materials for stone tool production by prehistoric populations.

CULTURE HISTORY

Regional Prehistory*

The prehistoric archaeological record of northern Delaware can be divided into four large blocks of time: The Paleo-Indian Period (ca 12,000 B.C. - 6500 B.C.), The Archaic Period (6500 B.C. - 3000 B.C.), the Woodland I Period (3000 B.C. -A.D. 1000), and the Woodland II Period (A.D. 1000 - A.D. 1650). A fifth time period, the Contact Period, may also be considered and spans from A.D. 1650 to A.D. 1750, the approximate date of the final Indian habitation of northern Delaware in anything resembling their pre-European Contact form. Each of these periods is described below.

Paleo-Indian Period (12,000 B.C. - 6500 B.C.) - The Paleo-Indian Period encompasses the time period of the final retreat of Pleistocene glacial conditions

*This summary of the regional prehistory is abstracted from Custer (1980, 1981,1983).

from Eastern North America and the establishment of more modern Holocene environments. The distinctive feature of the Paleo-Indian Period is an adaptation to the cold, and alternately wet and dry, conditions at the end of the Pleistocene and the beginning of the Holocene. This adaptation was primarily based on hunting and gathering with hunting providing a large portion of the diet. Hunted animals may have included now extinct megafauna and moose. A mosaic of deciduous, boreal, and grasslands environments would have provided a large number of productive habitats for these game animals in northern Delaware and watering areas would have been particularly good hunting settings.

Tool kits of the people who lived at this time were oriented toward the procurement and processing of hunted animal resources. A preference for high quality lithic materials is noted in the stone tool kits, and careful resharpening and maintenance of tools was common. A lifestyle of moving among the game attractive environments is hypothesized with the social organizations being based upon single- and multiple-family bands. Throughout the 5500 year time span of the period, the basic adaption remained relatively constant with some modifications being seen as Holocene environments appeared at the end of the Paleo-Indian Period.

Numerous Paleo-Indian sites are noted for northern Delaware including a hunting and processing site near Hockessin, possible quarry sites near Iron Hill, and isolated point finds.

Archaic Period (6500 B.C. - 3000 B.C.) - The Archaic Period is characterized by a series of adaptations to the newly emerged, full Holocene environments. These environments differed from earlier ones and were dominated by mesic forests of oak and hemlock. A reduction in open grasslands in the face of warm and wet conditions caused the extinction of many of the grazing animals hunted during Paleo-Indian times; however, browsing species such as deer would have flourished.

Sea level rise is also associated with the beginning of the Holocene in northern Delaware. The major effect of the sea level rise would have been to raise the water table, which helped to create a number of large swamps such as Churchmans Marsh. Adaptations changed from the hunting focus of the Paleo-Indians to a more generalized foraging pattern in which plant food resources would have played a more important role. Large swamp settings such as Churchmans Marsh apparently supported large base camps as indicated by the remains at the Clyde Farm Site. A number of small procurement sites in favorable hunting and gathering locales are also known in northern Delaware.

Tool kits were more generalized than earlier Paleo-Indian tool kits and showed a wider array of plant processing tools such as grinding stones, mortars, and pestles. A mobile lifestyle was probably common with a wide range of resources and settings being utilized on a seasonal basis. A shifting band-level organization which saw the waxing and waning of group size in relation to resource availability is evident. Known sites include large base camps (Clyde Farm and Delaware Park Site) and smaller processing sites located at a variety of locations.

Woodland I Period (3000 B.C.-A.D. 1000) - The Woodland I Period can be correlated with a dramatic change in local climates and environments that seem to be a part of events occurring throughout the Middle Atlantic region. A pronounced warm and dry period set in and lasted from ca 3000 B.C. to 1000 B.C. Mesic forests were replaced by xeric forests of oak and hickory and grasslands again became common. Some interior streams dried up, but the overall effect of the environmental change was one of alteration, not degradation. Continued sea level rise also made many areas of the Delaware River shore the sites of large brackish water marshes which were especially high in productivity. The major changes in environment and resource distributions meant radical adaptations for prehistoric groups. Important areas for settlements included the major river floodplains and

estuarine swamp areas. Large base camps with fairly large numbers of people are evident in many areas of northern New Castle County such as the Clyde Farm Site, the Crane Hook Site, and the Naamans Creek Site. These sites seem to have supported many more people than previous base camp sites and may have been occupied on a year-round basis. The overall tendency was toward a more sedentary lifestyle.

The overall tool kits showed some minor variations as well as some major additions from previous Archaic tool kits. Plant processing tools became increasingly common and seem to indicate an intensive harvesting of wild plant foods that may have approached the efficiency of agriculture by the end of the Woodland I Period. Chipped stone tools changed little from the preceeding Archaic Period; however, more broad-blade knife-like processing tools became prevalent. Also, the presence of a number of non-local lithic raw materials indicates that trade and exchange systems with other groups were beginning to develop. The addition of stone, and then ceramic, containers is also seen. These items allowed the more efficient cooking of certain types of food and may also have functioned for storage of certain surplus plant foods. Storage pits and house features are also known for northern Delaware during this period from the Delaware Park Site (Thomas 1981). The social organizations seem to have undergone radical changes during this period. With the onset of relatively sedentary lifestyles and intensified food production, which might have produced occasional surpluses, incipient ranked societies may have begun to develop as indicated by the presence of extensive trade and exchange and some caching of special artifact forms. In any event, by the end of the Woodland I Period a relatively sedentary lifestyle is evident in northern Delaware.

Woodland II Period (A.D. 1000 - A.D. 1650) - In many areas of the Middle Atlantic the Woodland II Period is marked by the appearance of agricultural food production

systems; however, in northern Delaware there are no indications of such a shift. The settlements of the Woodland I Period, especially the large base camps, were also occupied during the Woodland II Period and very few changes in basic lifestyles and artifact assemblages are evident. Intensive plant utilization and hunting remained the major subsistence activities up to European Contact. Similarly, no major changes are seen in social organization for the Woodland II Period of northern Delaware.

Contact Period (A.D. 1650 - A.D. 1750) - The Contact Period is an enigmatic period of the archaeological record of northern Delaware which began with the arrival of the first substantial numbers of Europeans in Delaware. The time period is enigmatic because no Native American archaeological sites that clearly date to this period have yet been discovered in Delaware. A number of sites from the Contact period are known in surrounding areas such as southeastern Pennsylvania. It seems clear that the Native American groups of Delaware did not participate in much interaction with Europeans and were under the virtual domination of the Susquehannock Indians of southern Lancaster County, Pennsylvania. The Contact Period ended with the virtual extinction of Native American lifeways in the Middle Atlantic area except for a few remnant groups.

Regional History

The first settlement in Delaware was by the Dutch West India Company in 1630 when a whaling station was established near the present town of Lewes. However, this post was destroyed by Indians in 1631 and no resettlement in that vicinity was attempted. A Swedish colony was established at Fort Christina, near the present site of Wilmington, in 1638, and was in turn captured in 1651 by Dutch stationed at Fort Casimir (now the town of New Castle). This effectively ended Swedish control of the area. The settlement pattern during this time was one of widely scattered farmsteads along the major watercourses, such as the Delaware

River, White Clay Creek, and Christina Creek (Weslager 1961). The English gained control of Delaware in 1664, and these settlers lived peaceably with the Swedes, Finns, and Dutch who had settled in the area previously (Weslager 1961). The granting of proprietary rights to William Penn and his representatives in 1682 essentially gave political and economic control of Delaware to Philadelphia (State of Delaware Department of State 1976:8).

Under English control, the Dutch and Swedish settlement pattern of scattered farmsteads along the Delaware River and its tributaries was maintained. However, the increasing need of Philadelphia merchants for marketable crops led to a shift away from subsistence farming and to the establishment of small villages at the heads of navigable streams and roadway intersections. These villages, local examples of which include Christiana, Ogletown, Stanton, Cantwell's Bridge (Odessa), and Salisbury (Smyrna), among others, acted as economic centers (Alice H. Guerrant, pers. comm. 1981) and were connected by the few major roads which existed at that time.

By the middle of the 18th century, increases in population and commerce had stimulated the growth of new towns and the development of transportation and industry. After the development of the major Chesapeake towns (e.g. Baltimore and Annapolis), the Delmarva Penninsula was largely thought of as an area of portage between the Chesapeake and Delaware Bays.

Technological advances during the 19th century, especially the construction of canals and railroads, allowed for increased development of commercial agriculture. By 1839, the Philadelphia, Wilmington, and Baltimore Railroad had begun service, and the Delaware Line provided transportation to the lower part of the state within about twenty years. The increased speed and capacity provided by rail vastly improved the marketability of products by the Lower Delaware farmer. Throughout the 19th century, Delaware roads remained in poor condition largely

because rail and water transportation (especially with the development of reliable streamboat travel) was much more convenient and effective. It was not until well into the 20th century, with the introduction of automobiles, that state roads significantly improved and opened up new areas for prosperous agricultural development (Hoffecker 1977:56).

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

Only one published report contains a reference to the project area proper. Thomas (1980) reported a prehistoric site on a knoll (southeast) of the intersection of Route 4 and New Churchman's Road. Although an informant reported finding artifacts at this location, only five prehistoric artifacts (three quartz flakes and two fire-cracked rock fragments) were found on the surface during Thomas' survey. During this survey a surface collection and postholer tests did not locate any additional cultural material. Hence investigations at this site were terminated and no further archeological work was recommended.